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Innovative Approaches to Urban Water Conservation

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**INNOVATIVE APPROACHES TO
URBAN WATER CONSERVATION**

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**Water Organizations in a Changing West
Natural Resources Law Center
University of Colorado School of Law
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I. Introduction

A. Summary

The City of Aurora is a full service community with a population of 230,000. Located on the high and dry plains east of Denver, all water must be transported to the area. The City has an independent water supply system, and is probably the only Colorado water supply entity which draws water from 3 major basins; the Platte, Colorado, and Arkansas. At Aurora, water service is included in the Utilities Department, which also has responsibility for sanitary sewer and storm drainage. All three of these are combined in a total water resource management approach. Lawn irrigation return flows through the storm drainage system and wastewater effluent are utilized as additional water supply sources, both directly and through exchange. The City concentrates exclusively on renewable surface water sources and retains significant deep groundwater supplies in reserve. Water related projects are planned and designed for multiple use and enhancement of the urban environment, to the maximum extent feasible. The City's conservation program may be categorized into the following: (1) Voluntary information types of programs, (2) Involuntary programs enforced by City ordinances, and (3) Structural and management programs which make better use of existing resources.

B. Goals and Policies

Following an extensive public involvement process, the Aurora City Council adopted a set of specific "Water Acquisition and Development Policies", in December of 1991. Those policies establish specific goals

related to reserve supplies and how the City should plan to serve new growth. In addition, water conservation is clearly recognized as an important component of these policies. Specific conservation policies adopted by City Council include the following:

- a. To maintain per capita usage levels in all customer classes.
- b. To reinforce and strengthen the wise use of water among Aurora citizens.
- c. To provide options for water conservation that promote individual responsibility over governmental regulation.
- d. To provide guidelines for developing and evaluating water conservation programs.
- e. Aurora will encourage the use of alternative water supplies such as treated effluent and Denver Basin groundwater for irrigation of parks and open spaces.
- f. Reuse of treated wastewater shall be included in master planning of new areas.

II. Voluntary Conservation Programs

A. Public Information

The City has an extensive public information program to promote voluntary water conservation. In 1991, the Aurora Utilities Department hired the consulting firm of Browne, Bortz, & Coddington to conduct two focus groups and a telephone survey on policy issues. Results from both the focus groups and the telephone survey indicated that the vast majority of Aurora citizens were unaware of the conservation efforts the City has been involved in for more than a decade.

Some highlights of the telephone survey included:

- * More than 40% were aware of the term "xeriscape."
- * The most recognized Aurora conservation program was the lawn watering education (every third day water schedule) which is a Metro-wide program (14.7% were familiar with this program).
- * Only 7.7% knew about Aurora's lawn permit program.
- * Interest in rebate programs was very strong and "deep."
- * 86% of the survey respondents said there should be more promotion of conservation programs.
- * 68% of the respondents were unaware of any type of conservation program.

BBC wrote in the conclusion of the report that the City is not getting credit for its efforts in conservation because most citizens are unaware of them, even though the populace endorses conservation efforts. Public sentiment is clearly on the side of conservation and City initiatives to encourage voluntary participation should be encouraged."

Public information efforts in the past have revolved around efforts such as billing inserts for the lawn watering schedule and xeriscape seminar schedules, booths at the Arbor Day/Earth Day Environmental Fair, brochures, news releases, an external newsletter called "Flowline", and public service announcements.

Aurora's location in the Metro area complicates media relations to an extent. While towns such as Colorado Springs or Greeley has a more defined "media market," Aurora is part of the "Denver market."

There are no daily newspapers which serve only Aurora. And while the major dailies in Denver have increased their coverage of the suburbs, they do not concentrate on Aurora issues as closely as the local weekly newspapers. Broadcast outlets are less likely to concentrate on Aurora issues, since their audiences are mostly metro-wide. KACT-TV (community access television) has also been very cooperative, but has a limited audience compared to commercial television stations.

Emphasis recently has been geared to making the programs "active" (i.e., encouraging action rather than just informing the public) instead of passive. In an effort to boost the profile of the programs, a xeriscape awards program is planned to provide more recognition to homes and businesses which employ water efficient landscaping techniques.

In addition, a flyer on water efficiency in irrigation systems was sent to Aurora homeowners associations. Jeff Prink, Irrigation Specialist for the City of Aurora, is meeting with the groups and their management companies to talk about ways of increasing efficiency, in a cooperative program with Parks & Recreation.

B. School Education

School education is presently done on a request basis for all grades K-12. Most presentations are on Aurora's water supply, conservation and water treatment process. The question that faces the Utilities Department at this time, is whether we are looking for quantity vs. quality in our school education program. The City presently has one full time staff member who works with school education any where from 20% to 60% of her time (it depends on the time of year and other projects). This situation has made it difficult to establish quality curriculum for all grades.

III. Involuntary Conservation Programs

A. Lawn Ordinance

Aurora is the only city in the Denver metropolitan area which has a lawn restriction ordinance. This ordinance has been in effect since 1980. It limits the amount of water intensive blue grass that can be installed in new lawns. The amount of blue grass varies by lot size. The ordinance is not overly restrictive. It basically prohibits property line to property line installation of blue grass turf. It forces new homeowners to plan their landscaping with water conservation in mind. The permit required for new lawns also insures that soil preparation materials are incorporated prior to either seeding or sodding. In the City's view, the ordinance has been a beneficial mechanism to reinforce the importance of conservation on residents who are new to the area.

B. Drought Restrictions

The City's drought restrictions policy recognizes that precipitation and corresponding water rights yields are highly variable in Colorado. Aurora plans its raw water system yield based upon average yield criteria. This allows much more economical system development costs. The City has not attempted to acquire water rights which would meet unrestricted demand through historical drought cycles. It is Aurora's policy that during an extended drought cycle of more than 1 year's duration, residents will experience mandatory demand reduction measures. These restrictions would include temporary inverted block pricing, as well as target reduction quotas for large irrigation users.

Aurora put this program in effect one time in 1980. It was highly successful in that usage was reduced in excess of 20%. Also important from a management perspective, the temporary inverted prices allowed revenues to be maintained in spite of the usage reduction.

III. Structural and Management Programs

A. Lawn Irrigation Return Flows

The three largest parks in Aurora and one of the golf courses are irrigated with lawn irrigation return flows. In all four cases, storm water detention/retention ponds have been incorporated into the design of the storm drainage system to provide a pumping source for irrigation water. These ponds are located on typical high plains tributaries which historically were dry except during precipitation events. As the area has urbanized these streams now have a constant base flow due primarily to urban irrigation return flows. Park irrigation from the drainage ponds allows a direct reuse of these return flows.

B. Wastewater Reuse

The City has the largest existing wastewater reuse plant in the metro area at 2.5 MGD. Effluent from this plant irrigates a golf course and adjacent parks in central Aurora. This has been a highly successful program which reduces the demand on the treated water system and also reduces the cost of irrigation water for the golf enterprise.

The City has prepared a master wastewater reuse plan for the eastern part of Aurora which will be developed over the next several decades. This plan calls for tertiary treated wastewater effluent to be provided to all parks and large irrigated areas. Approval and zoning have been

secured for a new wastewater reuse plant to be located in the area on Upper Sand Creek. This plant is proposed to eventually be expanded to 40 MGD. Wastewater reuse is an important existing and future component of the City's raw water supply.

C. Exchanges

The exchange of wastewater effluent discharged to the South Platte is also an important management technique which allows better use of existing supplies. The City currently exchanges effluent to the maximum extent possible for additional diversions at Aurora's raw water intake located further upstream on the South Platte. The City is currently pursuing a contractual arrangement whereby the wastewater effluent would be traded to a downstream irrigator in return for allowing Aurora to divert upstream under the irrigator's water rights priorities. This type of contract exchange could add significant supplies through better management.

D. Parks Irrigation

In contrast to many other cities, Aurora charges its Parks Department a higher rate for irrigation water than what private citizens pay for domestic use. The higher rate is based on rate studies and the unique peaking placed on the system. The higher rate encourages efficiencies by the Parks Department and encourages them to find alternative sources. As an example, the higher rate has justified the investment in a centralized automated irrigation system for major parks. One half of the cost of this system was funded by water fund revenues because of the conservation benefits.

IV. Conclusion

The difficulty in obtaining new supplies has encouraged Aurora and other cities to turn to alternative methods of meeting water demands. Conservation has historically been thought of as reducing customer demands. Conservation is now viewed in a broader perspective. It includes alternative sources and management techniques which can better utilize existing resources. Aurora has been a leader in these efforts and will continue as new urban supplies become even more difficult to obtain.